Broken Systems, Broken Bones: Orthopaedic Needs in Refugees and Crisis Settings

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INTRODUCTION:

Over 110 million individuals are currently classified as refugees, internally displaced persons (IDPs), or recipients of humanitarian assistance, many of whom sustain high rates of musculoskeletal trauma requiring timely, specialized care. These populations face substantial barriers to receiving orthopaedic healthcare, despite the high burden of trauma and musculoskeletal injury in crisis settings. Lack of orthopaedic care in humanitarian responses often leads to delayed treatment and preventable complications, leading to chronic disabilities in a vulnerable population. This review aims to map and characterize published orthopaedic studies focused on refugees, IDPs, and humanitarian contexts and identify efforts to improve orthopaedic care delivery in crisis-affected populations.

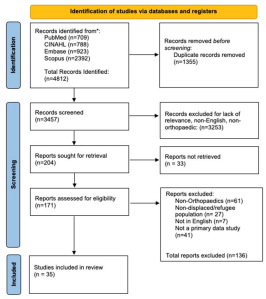
METHODS:

A systematic review was performed using PubMed, Scopus, Embase, and CINAHL using terms for displaced populations (refugee, migrant, asylum seeker, internally displaced, stateless, undocumented migrant, humanitarian crisis) combined with orthopedic-trauma keywords (orthopaedic trauma, fracture repair, surgical fixation, rehabilitation, mobility aid). English-language, primary-data studies involving refugees, asylum seekers, IDPs, or stateless persons that addressed orthopaedic care, rehabilitation, or access to care in humanitarian settings were included. Studies on non-displaced populations, non-orthopaedic topics, non–primary-data publications, or conducted outside humanitarian contexts were excluded. Extracted information comprised study design, patient demographics, interventions, and outcomes.

RESULTS: 35 studies met inclusion criteria, with most of the studies being retrospective (n=20, 57%) cohort studies conducted in host-country hospitals and camp settings. Only one RCT was conducted. Trauma and fracture management predominated (n = 28, 80 %), followed by infection (n=5,14%) and rehabilitation (n=4, 11%). The most common barriers reported included transportation/access (n=15,43%), security (n=14,40 %), language/health literacy (n=12,34%), infrastructure/capacity (n=10,29 %), financial constraints (n=9,26 %), and follow-up challenges (n=9, 26 %). Nutrition□related barriers appeared in only 2 (6 %) studies, and comorbidity management in only 1 (3 %). Of the included articles, the most common outcomes measured were length of stay (n=8,23%), amputation rates (n=7,20%), and complication rates (n=6,17%). The least common outcomes were patient-reported outcomes (PRO) (n=2,6%), return to activity/work (n=1,3%). Needs emphasized accessible rehabilitation services (n=14,40%), multidisciplinary care (n=13,37%), and health-system strengthening (n=11,31%). Recommendations focused on system integration (n=13,37%), provider training (n=12,34 %), and expanded rehabilitation programs (n=11,31%).

DISCUSSION AND CONCLUSION:

Displaced populations face tremendous barriers including transport, security, and infrastructure deficits, which delay presentations and lead to higher complication rates.. Despite 80 % of studies focusing on acute trauma care, fewer than 6 % measured patient□reported outcomes, and none reported readmission or pain scores—critical metrics in post□acute recovery. Addressing these gaps requires close attention to targeted training of local providers and scalable rehabilitation models to improve continuity of care and patient□centered outcomes. In conclusion, our findings highlight the critical barrier, need, and outcome elements and their contextual factors in orthopedic care for displaced populations. Contextual factors, such as setting (camp versus host□country hospital) and resource availability, play a role in access and treatment outcomes. Without systematic investment in rehabilitation, provider training, and data-driven protocols, displaced patients will continue to suffer avoidable disabilities.



Author (Year)	Country	Refugee Type	Study Design	Sample size, n	Orthopaedic Domain	Population Studied	Humanitarian Setting?	Country of Study	Care Setting (Camp, Host Hospital, urban center)	Refugee identified?
Kalyoncu et al. (2019)	Turkey	Syrian Refugees, Iraqi or Afghan refugees and Economic Migrants	Retrospective cohort study	1000	Trauma	Children	Yes	Turkey	Tertiary hospital in host country	Yes
Kalyoncu et al. (2017)	Turkey	Syrian Refugees (displaced due to war)	Retrospective cohort study	1195	Trauma	Adults	Yes	Turkey	Tertiary hospital in host country	Yes
Kalyoncu et al. (2020)	Turkey	Syrian Refugees (displaced due to war)	Retrospective cohort study	1458	Trauma	Adults	Yes	Turkey	Tertiary hospital in host country	Yes
Kuper et al. (2020)	Democratic Republic of Congo	Refugees residing in children from Rorty, Ituri Province, Afghanistan, and Ethiopia	Retrospective cross-sectional study	13	Pediatric Ortho	Children	No	Democratic Republic of Congo	Urban Hospitals	Yes
Ikeda (2020)	Ethiopia	Refugees displaced by Ethiopia	Retrospective cross-sectional study	1,087	General musculoskeletal	Mixed (adults and children)	No	Ethiopia	Rural site	Yes
Sakamoto et al. (2018)	Japan	Syrian Refugees in Jordan	Retrospective cross-sectional study	75	Trauma	Adults	No	Japan	Urban Hospitals	No
Sakamoto et al. (2017)	USA	Syrian Refugees in the US Phase 2 Study Population	Retrospective cohort study	116	Trauma	Adults	No	USA	Urban Hospital	No
Kalyoncu et al. (2016)	USA	Syrian Refugees in the US Phase 1 Study Population	Retrospective cohort study	160	General	Mixed (Adults and children)	No	Jordan	Rural site (refugee camp)	No
Kalyoncu et al. (2018)	Tajikistan	Refugees from Afghanistan	Cross-sectional survey at hospital	14 (mixed sample)	Trauma	Adults	Yes	Tajikistan	Field hospital	Yes
Kingori et al. (2021)	United Kingdom	Syrian Refugees	Retrospective cohort study	2032	Trauma	Mixed (Adults and children)	No	Turkey	Urban center	Yes
Ndwiga et al. (2020)	South Africa	Urban displaced refugees	Retrospective cohort study	346	Amputation	Mixed (Adults and children)	yes	SUDAN	Hospitals/refugee centres	Yes
Kalyoncu et al. (2020)	USA	Urban displaced refugees	Retrospective cohort study	1000	Trauma	Adults	No	Rural Africa	Rural site	Yes
Ikeda et al. (2021)	Japan	Refugees in Ethiopia	Retrospective cohort study	2007	Orthopaedic Infection	Mixed (Adults and children)	Yes	Ethiopia	Rural Africa	Yes
Kalyoncu et al. (2020)	Turkey	Displaced Syrian refugees	Retrospective cohort study	868	General	Children	Yes	Turkey	Government run hospital	Yes
Kalyoncu et al. (2018)	Turkey	Syrian refugees in Kilis	Retrospective cohort study	18	Trauma	Adults	Yes	Turkey	Tertiary hospital in host country	Yes
Kuper et al. (2020)	Canada	Immigrants and refugees	Retrospective cohort study	11,273	Arthroplasty	Not specified	No	Canada	Urban hospitals	No
Kalyoncu et al. (2019)	USA	Refugees from DRC and Burundi	Retrospective cross-sectional study	4576	General	Mixed (Adults and children)	Yes	Tanzania	Refugee camp	Yes
Pandurangi et al. (2020)	Germany	Ukrainian refugees	Retrospective observational study	13	Ulcers	Mixed (Adults and children)	Yes	Germany	Tertiary hospital in host country	Yes
Kalyoncu et al. (2020)	Pakistan	IDPs due to COVID Punishment	Cross-sectional survey	381 Ortho	Psychiatric/mental	Mixed (Adults and children)	Yes	Pakistan	Field district hospitals, schools, community centers	Yes
Sakamoto et al. (2019)	Turkey	Syrian Refugees displaced due to war	Retrospective Case series	501	Trauma and Plastics	Children	Yes	Turkey	Tertiary unit	Yes
Kalyoncu et al. (2021)	Turkey	Syrian Refugees	Retrospective cross-sectional study	1,087	Trauma	Adults	No	Turkey	Hospital in host country	yes
Kalyoncu et al. (2020)	Turkey	Syrian Refugees	Retrospective cohort study	145	Elective procedures	Mixed (Adults and children)	No	Turkey	Public Hospital in Gaziantep	Yes
Ikeda et al. (2020)	Turkey	Syrian Refugees	Retrospective cohort study	507	Trauma	Adults	No	Turkey and Syria	Prosthetic clinic	Yes
Kalyoncu et al. (2021)	Turkey	Syrian Refugees	Retrospective cohort study	185	Spine	Adults	No	Turkey	Government run hospital	Yes
Kalyoncu et al. (2020)	USA	Syrian survivors of Refugees medical evacuation to Ohio	Retrospective case series	3	Spine	Children	No	USA	Evacuated female clinic	Yes
Kalyoncu et al. (2018)	USA	Refugees in Lebanon	Retrospective cross-sectional study	148	general surgical care including orthopaedic	Mixed (Adults and children)	Yes	Lebanon	Nationwide hospital networks	Yes
Bhavsar et al. (2018)	Kenya	Displaced Children residing in Kakuma camp	Case report	17	General Paediatrics	Mixed (Adults and children)	Yes	Kenya	Urban Hospitals	No
Kuper et al. (2019)	Germany	Refugees seeking asylum	Case report	1	General musculoskeletal	Adults	No	Germany	Urban/rural hospital	No
Kalyoncu et al. (2018)	USA	Burmese Refugee	Case report	1	Trauma	Adults	No	USA	Urban/suburbs hospital	No
Kalyoncu et al. (2018)	France	Syrian Refugees and Afghan refugees	Retrospective case series	38	Trauma	Mixed (Adults and children)	Yes	Jordan	Field hospital	Yes
Kalyoncu et al. (2008)	USA	IDPs and post-affected residents	Original evaluation with Institutional Review Board approval	200	Trauma	Mixed (Adults and children)	Yes	Rwanda	Rural site and camp	Yes
Kalyoncu et al. (2021)	Turkey	Refugees and IDP	Retrospective Cross-Sectional Trial	54	Spine	Adults	No	Turkey	Clinics	Yes
Kalyoncu et al. (2020)	Jordan	Jordan affected residents	Retrospective case series	3	General	Adults	No	Neighbor Countries	Urban/remote hospitals	No
Kalyoncu et al. (2021)	Turkey	Syrian Refugees	Retrospective cohort study	450	General	Mixed (Adults and children)	No	Turkey	Tertiary hospital in host country	Yes